200-WS-01x

User Manual

WeatherPort

Wind Speed Sensors

Wind Run Sensors

Phone (530) 823-7185
Email nova@novalynx.com **Website** www.novalynx.com

Receiving and Unpacking

Carefully unpack all components and compare to the packing list. Notify NovaLynx Corporation immediately concerning any discrepancy. Inspect equipment to detect any damage that may have occurred during shipment. In the event of damage, any claim for loss must be filed immediately with the carrier by the consignee. Damages to equipment sent via Parcel Post or UPS require the consignee to contact NovaLynx Corporation for instructions.

Returns

If equipment is to be returned to the factory for any reason, call NovaLynx between 8:00 a.m. and 4:00 p.m. Pacific Time to request a Return Authorization Number (RA#). Include with the returned equipment a description of the problem and the name, address, and daytime phone number of the sender. Carefully pack the equipment to prevent damage or additional damage during the return shipment. Call NovaLynx for packing instructions in the case of delicate or sensitive items. If packing facilities are not available take the equipment to the nearest Post Office, UPS, or other freight service and obtain assistance with the packaging. Please write the RA# on the outside of the box.

Warranty

NovaLynx Corporation warrants that its products are free from defects in material and workmanship under normal use and service for a period of one year from the date of shipment from the factory. NovaLynx Corporation's obligations under this warranty are limited to, at NovaLynx's option: (i) replacing; or (ii) repairing; any product determined to be defective. In no case shall NovaLynx Corporation's liability exceed product's original purchase price. This warranty does not apply to any equipment that has been repaired or altered, except by NovaLynx Corporation, or that has been subjected to misuse, negligence, or accident. It is expressly agreed that this warranty will be in lieu of all warranties of fitness and in lieu of the warranty of merchantability.

Address

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1 FORWARD

Thank you for purchasing NovaLynx products. NovaLynx has been designing and manufacturing weather instruments since 1988. NovaLynx represents several well-known brands of quality manufacturers, including Gill Instruments, RM Young, Kipp & Zonen, and Vaisala. It is our hope that our products will meet all your monitoring requirements.

2 INTRODUCTION

WeatherPort 200-WS-01 Wind Sensors are moderately priced anemometers designed for general applications up to 125 mph (56 m/s). The sensors are easy to install and maintain. They are constructed of injection molded thermoplastic, anodized aluminum, and stainless steel for reliable operation in adverse environments.

The base of the sensor is designed to mount on a vertical 1.07" (27 mm) diameter mast. If the sensor cannot be mounted at the top of the mast, an optional side-mount boom (NovaLynx 200-153) is available.

Most versions of the 200-WS-01x sensor include 40 feet (12 m) of cable. The cable is attached to the side of the sensor, as shown in the photo, or it exits the base. Be aware that if the cable exits the base, it must be threaded through the supporting mast.

Cable (Side Exit)

The 200-WS-01 is a cup-style anemometer. One or more permanent magnets in the rotating cup assembly cause a reed switch in the base to close momentarily, so that the frequency of pulses is proportional to wind velocity, and the number of pulses is proportional to distance.

- Sensors designed for monitoring **wind speed** output 3 pulses per revolution (3 ppr).
- Sensors designed for monitoring **wind run** output 1 pulse per revolution (1 ppr).

3 PRECAUTIONS

Handle the sensor carefully as the cup assembly is fragile. Do not lay the sensor on its side which would place strain on the cup assembly.

The shield wire in the sensor cable is electrically connected to the shaft holding the bearing / cup assembly. The purpose is to bleed off static that would otherwise affect the sensor output. Therefore it is important to earth ground the shield wire for best results.

Installations where nearby lightning strikes are likely should include a properly grounded lightning rod above the level of the sensor, preferably on a separate tower.

4 SPECIFICATIONS

200-WS-01x Anemometer Specification	
Measurement Range	125 mph max (56 m/s max)
Speed Threshold	1.2 mph (0.54 m/s) *Except Model 200-WS-01B-TS, which has a slightly higher starting threshold due to a characteristic of the Teflon bearing.*
Speed Accuracy (3 ppr)	1 mph (0.4470 m/s) or ±3%
Speed Constant (3 ppr)	1.25 mph = 1 Hz (0.5588 m/s = 1 Hz)
Distance Constant (1 ppr)	960 pulses per mile (596.5 pulses per km) 0.001042 miles per pulse (0.001676 km per pulse)
Transducer Type	Reed switch, magnet activated
Maximum Rating	10 mA @ 50 V (ac or dc)
Turning Radius	4 inch (10.16 cm)
Cable	40 feet (12 m), 2 conductor, 24 AWG, shielded, tinned leads *Except Model 200-WS-01C, which has 1' (0.3 m) hookup wire.*
Mounting	1.07 inch diameter by 0.82 inch socket (27 mm dia x 21 mm) *Note: Standard 3/4" IPS pipe is 1.05" o.d. and fits the socket.*
Dimensions	4.5" H x 8.2" W x 8.2" D (12 x 21 x 21 cm)
Weight / Shipping	0.95 lbs (0.43 kg) / 2 lbs (0.9 kg)

5 MODEL NUMBERS AND FEATURES

Wind Run					
Model	**Pulses/Rev**	**Cable Exit**	**Cable Type**	**Cable Length**	**Feature / Use With**
200-WS-01B-C1	1	Side	2-Conductor, 24 AWG	40 feet (12 meter)	General Purpose
200-WS-01C	1	Bottom	22 AWG Hookup Wire	1 foot (0.3 meter)	200-2510-B, 200-2511-B

Wind Speed					
Model	**Pulses/Rev**	**Cable Exit**	**Cable Type**	**Cable Length**	**Feature / Use With**
200-WS-01A	3	Bottom	2-Conductor, 24 AWG	40 feet (12 meter)	General Purpose
200-WS-01B	3	Side	2-Conductor, 24 AWG	40 feet (12 meter)	General Purpose
200-WS-01B-TS	3	Side	2-Conductor, 24 AWG	40 feet (12 meter)	Teflon Bearing
200-WS-01MB	3	Side	2-Conductor, 24 AWG	40 feet (12 meter)	Metal Base

5.1 Wind Run Sensors

Wind run is the distance or length of flow of the air past a point during an interval of time. It is usually measured in miles or kilometers. NovaLynx wind run sensors produce one switch closure per

revolution of the cups, reducing demands on an electronic counter compared to the three-pulses per revolution of the wind speed sensors.

The calibration constant for wind run is 960 pulses per mile (596.5 pulses per kilometer). The reciprocal of these numbers gives the value of each pulse: 0.001042 miles per pulse (0.001676 km per pulse).

5.2 Wind Speed Sensors

WeatherPort wind speed sensors produce three switch closures for each revolution of the cup assembly. The ratio of closed-to-open time is nominally 1/10 of the total period for a revolution of the wind cups. This duty cycle may change slightly as the sensor ages and with exposure to temperature extremes.

Note: *Model 200-WS-01B-TS has a slightly higher starting threshold due to a characteristic of the Teflon bearing.*

6 SITE SELECTION

WARNING: Avoid overhead power lines whenever possible. If there are overhead power lines, use extreme care to prevent contact with the power lines while installing the equipment.

Choose a mounting location for the wind sensor that is free of obstructions since nearby objects can create eddy currents that will affect the wind measurements. Try to locate the wind sensor so that the nearest object is 10 x T away from the wind sensor mast, where T is the height of the object.

Roof mounted sensors should be placed on the upwind side of the building and away from all exhaust vents. If the sensor is located on top of a building the sensor height should be 1.5 x H, where H is the height of the building.

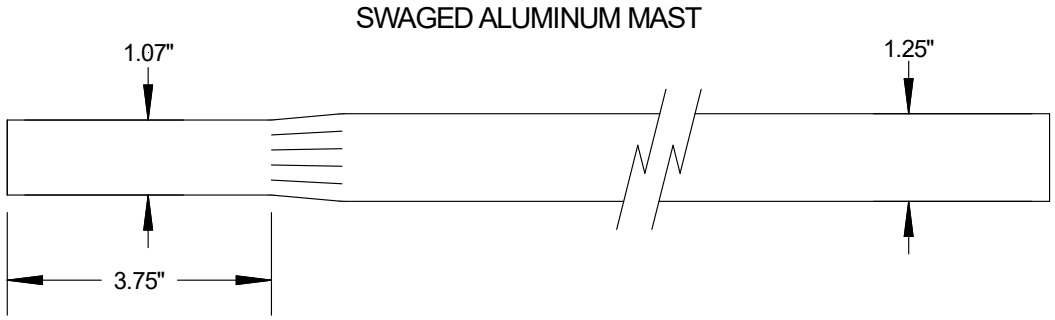
In all cases when the wind sensor data is to be correlated to National Weather Service data or World Meteorological Organization data, the standard exposure is 33 feet (10 meters) above the ground.

7 MOUNTING OPTIONS

CAUTION: Be careful when working on equipment that is mounted above you. Do not allow others to stand below when equipment is being installed as falling objects can be hazardous.

The support for the sensor must be rigid or supplemented with guy wires. A mast can be assembled from pipe, using larger pipe at the base and ending in ¾" IPS pipe at the top. The mast should be easy to reach for servicing the sensor and should be properly anchored and grounded. A tilt-down arrangement can eliminate the need for lifts or ladders during installation and service.

NovaLynx tripods are a convenient alternative for temporary and permanent installations. The tripods are available in three sizes: 3', 5' and 10' tall (Appendix A). Masts are available in various lengths. Swaged mast segments can be fitted together to obtain the overall height needed. The swaged end is the correct diameter for mounting 200-WS-01x sensors.



The base of the 200-WS-01 sensor accepts 1.07" (27 mm) diameter pipe. To assemble the sensor to the pipe, simply loosen the two mounting screws on the base of the sensor, slip the sensor onto the pipe, and tighten the screws using moderate torque. *Note, if the cable exits the bottom, the cable will have to be fed through the pipe before placing the sensor.*

If the wind speed sensor cannot be mounted at the top of the mast, the NovaLynx 200-153 Mounting Arm (sold separately) can be mounted to the mast or tower leg at the desired height.

200-153 Mounting Arm

The supporting mast or tripod should be properly grounded. In areas where lightning is likely, install a lightning rod to minimize lightning damage. NovaLynx 190-Series Lightning and Surge Protection products are available to accommodate most applications.

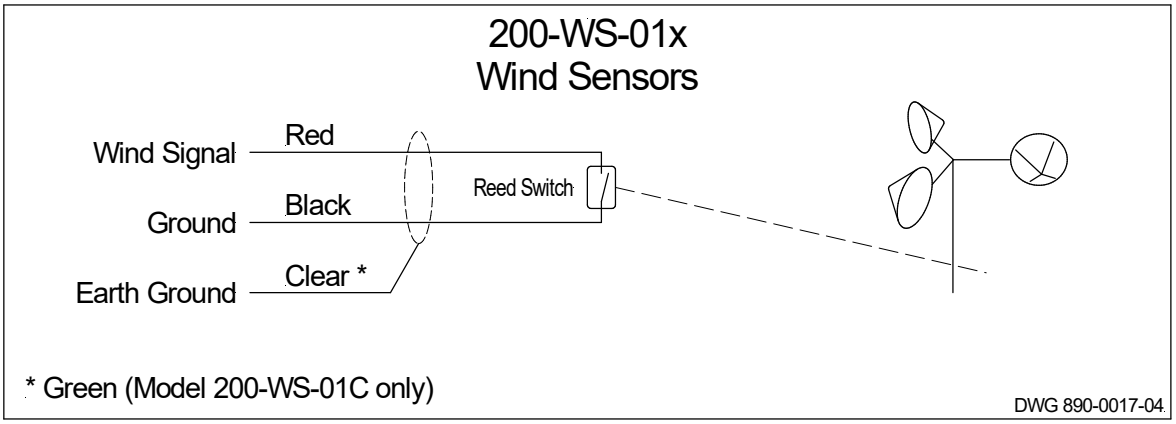
8 INSTALLATION

1. Loosen the two mounting screws on the base of the sensor.
2. Place the sensor on the top of the mast or mounting stub.
3. Tighten the mounting screws using moderate torque.

The PVC jacket of the cable will last for many years outdoors under normal circumstances. In harsh environments it may be necessary to protect the cable with conduit.

Route the sensor cable down the mast and to the monitoring equipment in the most direct manner. Fasten the cable to the mast with cable ties to prevent whipping during high velocity winds. For best results, use plastic cable ties that are resistant to ultra-violet radiation and place them at two foot intervals. Leave a "drip loop" of cable below the entry point to the equipment enclosure to help keep moisture out.

Turn off power to the logger or other monitoring device before connecting the sensor.



NOTE: The reed switch output is "dry contact". A pull-up resistor may be needed on the input channel to monitor the switch closure.

9 MAINTENANCE

Wind sensors experience vibration due to high velocity wind. The vibration can loosen the mounting screws or the support structure. Regular inspection of the mounting hardware is required to prevent damage to the sensor.

1. Tighten the mounting screws if necessary (do not over-tighten).

2. Spin the anemometer cup assembly. It should turn freely. Apply a few drops of light machine oil (e.g. fishing reel oil) to the bearing if needed. *Note: Do not use WD-40 or similar products, as they wear off quickly, leaving the bearing dry and susceptible to rust.*
3. Inspect the cable and ensure it is secured to the mast to prevent damage due to wind whipping.
4. If one of the cup arms is damaged, the sensor may be user-repairable. Order the NovaLynx kit that matches your sensor:

2502-14-01B	3-magnet wind cup assembly for **wind speed** sensors
2502-14-01C	1-magnet wind cup assembly for **wind run** sensors

10 FUNCTIONAL TESTS

The following checks can be done with an ohm-meter after the sensor has been dismounted from the tower or tripod. These tests can help determine whether the sensor needs repair or adjustment.

Set the ohm-meter to a low resistance range and touch its leads together to check for zero ohms. If it is an analog meter adjust the dial to read zero ohms. Connect the ohm-meter to the signal wires from the anemometer (polarity is not important).

Rotate the cup assembly slowly until you notice the meter reading drop to less than 10 ohms. Continue to rotate until the switch opens. Do this for each of the magnets in the cup assembly (3 magnets in wind speed models, 1 magnet in wind run models).

- If the meter always reads a low resistance then the reed switch is not opening (the contacts may have welded together) or there may be a short circuit in the cable.
- If the switch never closes then there may be a break in the cable or the magnets are not near enough to activate the switch. Check the distance between the cup assembly and the base. The gap should be about 1/16" (1.6 mm).

APPENDIX A TRIPOD DIMENSIONS